Energy and Climate

In Rockville, transportation and buildings are the largest consumers of energy and the largest generators of greenhouse gas emissions. Becoming more energy efficient and using green energy sources can not only save money, but help minimize pollution and the effects of climate change.

Energy

Energy (electricity, gasoline, natural gas, etc.) is fundamental to our daily lives, community and economy. The price of energy can fluctuate by the day, even by the minute; presenting growing opportunities and challenges for residents, businesses and local governments.

Getting the energy we need to the place we need it impacts the environment in different ways. The extraction, conversion and use of different energy sources generate various impacts on the environment, including emissions, wastes and land and water impacts. For example, conventional electricity generation includes the combustions of fossil fuels (coal, natural gas and oil) that contribute to air and water pollution, and greenhouse gas (GHG) emissions.

At the same time, aging and inefficient infrastructure and buildings present additional challenges for retrofits and improvement. While no form of energy generation and transmission is completely benign, there are environmentally preferable options that can reduce impacts.

Planning and maintaining adequate, secure, reliable, affordable and sustainable energy sources and transmission systems is essential for long term community sustainability.

Climate

Recognizing the need for action, on Sept. 26, 2006, the Mayor and Council signed on to the U.S. Mayor's Climate Protection Agreement—an overarching document committing local governments to take action and adopt policies that minimize their emissions of carbon dioxide and other greenhouse gases. Rockville is one of many local governments across the country that is conducting evaluations to identify opportunities to reduce emissions generated by the community and government operations.

A greenhouse gas emissions inventory, also referred to as a "carbon footprint," not only provides a snapshot of a city’s energy consumption patterns, but is the foundation of a jurisdiction's actions to address climate change. The inventory accounts for the amounts and sources of GHG emissions, such as carbon dioxide (CO_2), methane (CH_4) and nitrous oxide (N_2O) from different sectors and operations. It is key to establishing a baseline, tracking performance and assessing the effectiveness of reduction measures and improving efficiencies.

Rockville is working with Maryland, the Metropolitan Washington Council of Governments and Montgomery County to support regional climate protection programs and has committed to both the U.S. Mayors Climate Protection Agreement and the Cities for Climate Protection Campaign sponsored ICLEI-Local Governments for Sustainability. Under these programs, Rockville is working to inventory and reduce greenhouse gas emissions, increase energy efficiency, decrease air pollution, create jobs and reduce energy expenditures.

Community Emissions Inventory

Rockville prepared a community greenhouse gas emissions inventory (carbon footprint) for a baseline year of "approximately" 2006 to coincide with the baseline parameters of the Maryland Greenhouse Gas Reduction Act of 2009. [1] The City utilized ICLEI's Clean Air and Climate Protection (CACP) software to conduct the inventory. The City also coordinated with Montgomery County, Pepco and the Metropolitan Washington Council of Governments for data collection, training and technical assistance.

According to 2006 estimates (Figure 1), the Rockville community generated approximately 2,886,760 metric tons of carbon dioxide equivalents (CO_2e). Sources of emissions can be broken down into three major categories:

- **Buildings**: The electricity, natural gas and fuel oil used in all buildings account for over 58 percent of greenhouse gas emissions. Commercial buildings account for approximately 37 percent and residential buildings account for approximately 21 percent of emissions.
- **Transportation**: Energy used by the transportation sector account for nearly 40 percent of emissions.
- **Other sources**: Emissions from waste and government operations were negligible; combined, they account for less than 1 percent of the community's emissions.

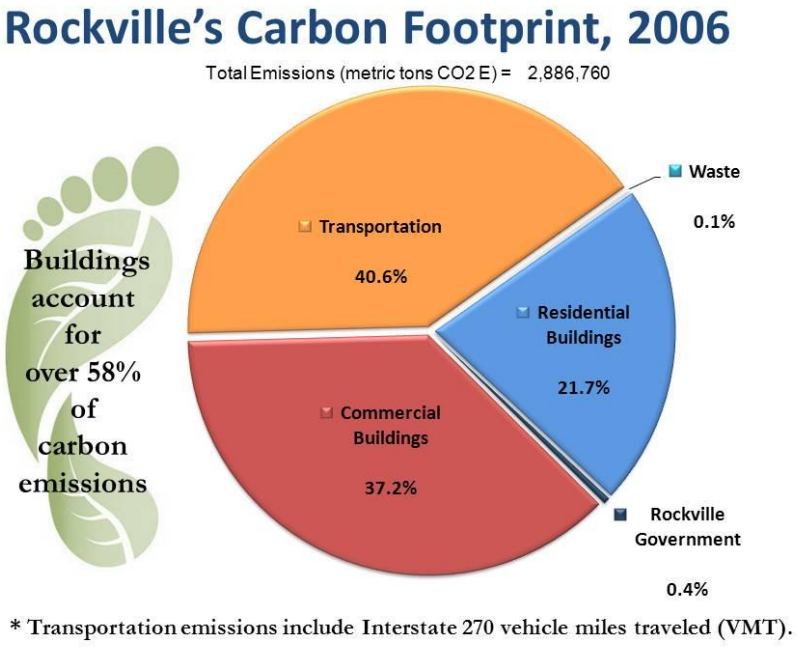

Figure 1: Rockville Community Greenhouse Gas Emissions (2006)

[1] Community analysis data was sorted into residential, commercial, transportation, and waste. Pepco provided residential and commercial electricity data for 2006. Washington Gas provided 2009 natural gas residential and commercial data (2006 data was not available). Both electricity and natural gas data could only be provided by zip code, which extend beyond Rockville's jurisdictional boundary. Therefore, emissions from natural gas and electricity are likely overestimated. Emissions from the transportation sector were estimated from 2005 Vehicle Miles Traveled (VMT) data provided by the Metropolitan Washington Council of Governments (COG). Given that this data includes VMT along Interstate-270 (I-270), a major six to eight lane highway linking Frederick, Maryland to Washington D.C., transportation emissions generated by the Rockville community are also likely to be overestimated in this inventory. Tonnage of waste is limited to City residential waste collection and does not include commercial haulers. Therefore, emissions generated from the waste sector are likely to be underestimated. Data conversion from fiscal year to calendar year was needed in many cases.

Energy and Climate Goals and Policies

Energy and climate policies are generally made at the global, federal and state level. The State of Maryland has adopted a series of goals and policies to reduce energy consumption, increase renewable energy use and reduce greenhouse gas emissions (Table 1).

Table 1. Maryland Energy and Climate Goals and Policies	
Energy Reduction	The EmPower Maryland Energy Efficiency Act of 2008 sets a target to reduce per capita electricity consumption 15% by 2015.
Renewable Energy	Maryland's Renewable Portfolio Standard (RPS) requires 20% of Maryland's electricity to be generated by renewable energy sources by 2022.
Climate Action	The Greenhouse Gas Emissions Reduction Act of 2009 requires Maryland to reduce greenhouse gas emissions 25% by 2020 (relative to 2006 levels).

While Rockville does not currently have State or federal regulatory requirements to directly reduce energy and greenhouse gas emissions, the City has taken significant efforts address these issues. In October of 2007, the Mayor and Council adopted the *Strategy for a Sustainable Rockville*, a comprehensive strategy to serve as a blueprint to make Rockville more sustainable and environmentally sensitive. While this strategy primarily targets City operations and activities, the City encourages similar actions by individual businesses and residents.

Examples of City efforts to address energy and climate issues include:

- Land use planning and urban design
- Transportation planning
- Green building code adoption and enforcement
- Solid waste and materials management
- Efficient local government facilities and operations
- Efficient water treatment operations
- Green power procurement and generation
- Education and outreach

With proper planning and management, our community can use energy in a smarter, more efficient way and invest in renewable resources to reduce environmental impacts, maximize reliability, reduce long-term costs and minimize emissions. The will enable our community to respond efficiently to changing energy challenges, policies and costs, and will help enhance our economic competitiveness and long-term sustainability.